

## INTEGRATION OF ECONOMIC STATISTICS: THE CONCEPTUAL AND OPERATIONAL FRAMEWORK

NEW ISSUE

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**Introduction**

This paper describes the nature of integrated economic statistics produced by the ABS, the need for and development of such statistics, and the main features of the conceptual and operational framework for the production of such statistics including the role of the Integrated Register.

2. Part 1 of this paper outlines the general aspects of integrated economic statistics while Part 2 concentrates on the nature and role of the Integrated Register as a key component of the operational framework for these statistics.

**PART 1: INTEGRATED ECONOMIC STATISTICS****General Aspects**

3. There are a number of prerequisites for the successful conduct and processing of statistical collections. These could be said to constitute statistical infrastructures and include the following:

- i Registers or lists which contain the **STATISTICAL UNITS** from or about which statistical information is collected.
- ii Statistical forms containing the **DATA ITEMS** which specify the statistical information to be collected.
- iii Editing, tabulation and other **PROCESSING SYSTEMS** and associated **DATA BASES** which store, check, manipulate and assemble the collected statistical information ready for publication.
- iv **STATISTICAL STANDARDS** which set out the concepts and definitions according to which statistical units are recorded on registers and data items are specified on forms, and the classifications (e.g. those relating to industry, size and geographic area) according to which

the units and data are classified during processing.

Such infrastructures, historically, have tended to be collection specific and to vary a great deal in comparability, content and quality between collections.

**Aspects of Integrated Statistics**

4. The term 'integrated statistics' is used by the ABS in a broad sense to mean the body of statistical information which has been collected in and compiled from different censuses and surveys in accordance with the following criteria:

- i A **COMMON** conceptual framework of statistical standards, including standard statistical unit and data item definitions, standard classifications and standardised methods.
  - ii An **INTEGRATED** operational framework comprising an integrated register of statistical units and compatible statistical processing systems and data bases.
5. Statistics which have been collected and compiled in such an 'integrated' manner have the following characteristics:
- i They *optimise efficient data management*, largely because the data are standardised and conceptually compatible and can therefore be more readily manipulated and assembled from different collections (e.g. without gaps or overlaps) into comparable measures of employment, capital expenditure, turnover, value added, etc. for different industries, local government and other areas, institutional sectors and other statistical aggregates, such as size groupings.
  - ii They *maximise the utility of statistical information* for government, business and other users, because statistics from different

collections, such as the mining census and the capital expenditure survey, can be more readily compared and fitted into comprehensive national or regional data models such as input/output tables and the national accounts.

- iii *They are cheaper to produce than equivalent non-integrated statistics* at the same standard of quality because duplicate collection is avoided of those statistics which, under integration, can be compiled from already collected data and because duplication in the statistical infrastructure (e.g. maintaining separate registers) is eliminated.
- iv *They help to minimise respondent burden* because they avoid multiple inclusion of the same business units in collections of different industries. Also the infrastructure for integrated statistics provides mechanisms for controlling both the range of data items included in the various integrated collections and the extent to which the same business unit is included in a number of sample collections.

#### The Need for Integrated Statistics

6. The concept of integrated statistics emerged in the ABS in the early 1960s. The then existing configuration of independently developed collections, while reasonably adequate for their original purpose, represented overlapping, largely unco-ordinated, manually maintained and poorly reliable statistical series. Increasingly they were unable to meet needs arising from several concurrent developments:

- i The emergence in the 1940s and 1950s of comprehensive and sophisticated data models, such as the national accounts and input/output tables, which required, as data inputs, statistics which were capable of being validly and readily assembled in accordance with those data models, even though they would continue to be collected separately.
- ii The increased use of statistics in developing plans and policies, and in analysing their effectiveness, which required more comparable and more reliable statistics.
- iii The computerisation of information systems which, for maximum operational efficiency and effective data management, required standardised and reliable data inputs.

7. The ABS continues to experience a strong growth in user demands for new, more timely and better co-ordinated statistics on the one hand, and constraints and calls for reductions in respondent burden and government-induced paper work on the other. These competing demands have imposed additional pressures on the ABS to manage its data more effectively. They are apparent in the findings and recommendations of a number of official inquiries, including:

- i The Committee on Integration of Data Systems (Crisp Committee) of 1974.
- ii The Study Group on Structural Adjustment (Crawford Report) of 1978.

iii The Joint Committee on Public Accounts in its report (192) on 'The Collection and Dissemination of Statistics' of 1981.

8. These inquiries have supported the continuing conceptual and operational integration of data systems as a means of managing data more effectively, thereby increasing the usefulness of statistics and containing the public and private costs involved in collecting and disseminating them.

#### The Development of Integrated Economic Statistics

9. Having recognised the need for integrated statistics in the early 1960s, the ABS gave high priority to their development, starting with the introduction of the first integrated economic censuses in 1969 in respect of the year 1968-69. These censuses covered the mining, manufacturing, electricity and gas production and distribution, wholesale and retail trade and selected service industries.

10. Experience in processing these censuses led the ABS to modify its approach, in order to reduce and spread more evenly the costs and workloads involved. The main developments have been:

- i Conduct of annual censuses of the mining, manufacturing and electricity and gas production and distribution industries.
- ii Adoption of a cyclical program of, usually, five yearly integrated economic censuses and surveys of those industries for which collection is not justified on an annual basis, rather than the original plan of conducting them all concurrently.
- iii Use of sample survey methodology wherever consistent with major user requirements.
- iv Use of a much smaller questionnaire (postcard style) for the very small business units (e.g. for manufacturing establishments with less than 4 employees).
- v The development of a more efficient computer based economic censuses processing system, using more advanced computer technology than that available for the 1968-69 censuses.

11. These changes and other improvements, including a revised standard industrial classification, have been in place since the 1977-78 integrated economic censuses. The new computer processing system, called the Integrated Economic Statistical Information System (IESIS) has proven itself to be reliable, versatile and highly efficient.

12. IESIS, together with the Integrated Register of business units, provided the main components of the operational framework for the collection and processing of integrated statistics in the late 1970s and early 1980s. Since then, a new Integrated Register Information System (IRIS) has been developed to store and support the Integrated Register.

13. In addition to these improvements, the ABS has extended the scope of its integrated statistics. The annual agricultural production census, although an integrated collection, differs from other economic censuses in that

it concentrates on land use, livestock numbers and output measures and collects little in the way of financial data. Other integrated collections include quarterly sample surveys covering capital expenditure, stocks, and employment and earnings for a wide range of industries, monthly and quarterly surveys of production and of retail sales, and periodic surveys of research and developmental expenditure.

14. The integration of statistics has also been improved by the introduction of:

- i Comparable methods for applying industry and public/private sector classifications in employer and household based labour force statistics.
- ii The *Australian Standard Commodity Classification* (ASCC) (1207.0 and 1208.0) as a framework for improving the comparability of commodity statistics and as a facility to enable comparable production, import and export statistics to be compiled.

### The Infrastructure for Integrated Statistics

15. The conceptual and operational frameworks mentioned in paragraph 4 constitute the necessary infrastructure for the collection and compilation of integrated statistics. These frameworks are outlined below.

16. The common CONCEPTUAL FRAMEWORK of statistical standards for integrated economic statistics consists of the Australian National Accounts model and related standards for statistical units, classifications and data items.

17. The Australian National Accounts model is based on the document 'A System of National Accounts' (SNA), a United Nations statistical standard, and is fully articulated in the ABS publication *Australian National Accounts: Concepts, Sources and Methods* (5216.0). The SNA based national accounting concepts have a major influence over the specification of the following statistical standards used in the collection and compilation of integrated statistics.

#### i STANDARDS FOR STATISTICAL UNITS.

These consist of standard definitions and working rules for identifying and defining statistical units, i.e. the entities from or about which statistics are collected or in respect of which statistics are compiled. Although these cover a very wide range, those of main interest here are the transactor units of the national accounts which contribute to gross national product. These units cover all businesses, statutory and other government organisations and non-profit institutions. Each of these units can be defined in terms of a number of different and hierarchically related classes of units. For example, a manufacturing business which consists of a holding company (which has two factories and a separately located warehouse) and two subsidiary companies (one of which operates another factory while the other exists in a legal sense but has ceased to operate) could be defined as:

- an enterprise group;
- two enterprises (i.e. operating legal entities);
- three legal entities (i.e. companies);
- three establishments (i.e. the factories) and one ancillary unit (i.e. the warehouse); or
- four locations (i.e. sites at which the enterprises operate—one for each factory and the warehouse).

Standard definitions and working rules for these classes of units, i.e. enterprise groups, enterprises, etc. are detailed in *Standards for Statistical Units in Australian Integrated Economic Statistics* (SSU) (1231.0) and are also contained in other ABS standards documents and work manuals.

#### ii STANDARDS FOR CLASSIFYING STATISTICAL UNITS.

The most important among these is the *Australian Standard Industrial Classification* (ASIC), (1201.0 and 1202.0) which was introduced in 1969 for use in the first integrated economic censuses and has been revised twice since then. It is now an ABS-wide standard and defines, at its most detailed level, 466 individual industries. Other standards for classifying units in integrated economic statistics include the *Australian Standard Geographical Classification* (ASGC) (1216.0), a standard Public Sector/Private Sector classification, a 'type of legal organisation' classification and various size classifications.

#### iii STANDARDS FOR STATISTICAL DATA ITEMS.

These consist of standard definitions for individual items of data. In some cases these standard data item definitions are backed up by more detailed interpretative and explanatory notes. In the case of COMMODITY ITEMS, the definitions are generally set out in relevant ABS commodity classifications such as the *Australian Import Commodity Classification* (AICC), (1204.0), the *Australian Export Commodity Classification* (AECC), (1203.0), and the *Australian Standard Commodity Classification* (ASCC), (1207.0 and 1208.0). In the case of OTHER DATA ITEMS, including STRUCTURAL DATA ITEMS such as wages and salaries, capital expenditure and depreciation, the definitions are formulated, where applicable, in accordance with national accounting concepts.

18. The key components of the OPERATIONAL FRAMEWORK for integrated economic and related statistics consist of:

i THE INTEGRATED REGISTER INFORMATION SYSTEM (IRIS). The uses, functions and features of IRIS are described in Part 2 of this paper.

ii THE INTEGRATED ECONOMIC STATISTICAL INFORMATION SYSTEM (IESIS). This is the centralised processing and tabulation system for most integrated economic censuses and surveys.

19. Although IRIS and IESIS provide the main components of the operational framework for integrated statistics, a number of other systems, such as the Agriculture Common Census and Survey System (ACCESS) and the Regular Enterprise Surveys System, have been added to that framework.

### Current and Future Developments

20. The present conceptual and operational frameworks for integrated economic statistics are not yet complete. Also the current scope of integrated economic censuses and surveys does not cover all industries and activities for which there are user demands for statistics.

21. Accordingly, further work is proceeding, as resources permit, to extend the frameworks and the scope of integrated statistics. The main developments currently under way include:

- i Consideration of extensions to the scope of integrated economic censuses and surveys to cover more of the important services industries.
- ii Research aimed at firming up units standards for industries not hitherto covered by integrated economic censuses and surveys (e.g. services industries, non-profit institutions).
- iii Introduction of an institutional sector classification, i.e. the Standard Institutional Sector Classification of Australia (SISCA).
- iv Enhancement of the ASCC to improve the standardisation and comparability of commodity items collected in various ABS statistical collections and its extension to provide standard definitions for services items.
- v Review of the ASIC to improve the specification of those services industries likely to be covered in future integrated economic censuses and surveys.

## PART 2: ROLE OF THE INTEGRATED REGISTER

### Introduction

22. Since its development in the late 1960s as part of the preparations for the first integrated economic censuses in 1969, the Integrated Register has played a pivotal role in the operation and extension of the ABS integrated economic statistics system. The importance of the Integrated Register in this process is based on four key factors.

23. First, an Integrated Register is the most effective means of ensuring the consistent application of standard statistical units in different statistical operations and at different times.

24. Second, use of an Integrated Register eliminates overlapping and unintentional gaps between lists of units relating to different industrial sectors. It ensures uniformity in classifying individual units, particularly by industry, in the different statistical operations. This requires that the Integrated Register be accepted as the single source of information about the classification of

any unit for any purpose within the integrated economic statistics system.

25. Third, an Integrated Register is essential to implement the hierarchical links between units that are an inherent characteristic of a multi-level structure of economic units such as has been promulgated in the SNA and adopted by the ABS for use in its integrated economic statistics system.

26. Fourth, an Integrated Register represents the most cost effective means of providing ABS collection areas with frameworks for sample surveys, and of achieving fully co-ordinated design and operation of such surveys. In this respect the ability to control sample overlap between surveys and rotation of samples within surveys is of significant benefit in minimising the response burden on individual units within the business community.

### Uses in Economic Census and Survey Operations

27. The unit records in the Integrated Register contain the information required to precisely delineate each unit in terms of ownership (name), physical location (address), industry (ASIC code) and, in some cases, kind of activity. The records also contain any additional information required for mailing statistical forms (e.g. postal address, details of special mailing arrangements, etc.).

28. Marshalling information on the hierarchic structure of units (i.e. enterprise groups, enterprises, legal entities, establishments and locations) facilitates the collection of data from multi-establishment enterprises. Data not required (or not generally available) at the establishment level is collected at the enterprise level by means of a separate enterprise return. The enterprise return is also used to collect summary data for key items reported in detail on establishment returns, as a check on the accuracy and completeness of reporting.

29. The register's recording of relationships between units also plays an important part in classifying units to industries objectively, on the basis of data reported in their census returns. Establishments are classified to industry on the basis of data reported on production, sales, etc; multi-establishment enterprises and enterprise groups can then be classified according to data relating to their component establishments. Ancillary units can be classified on the basis of the predominant industry among the establishments they serve.

30. The Integrated Register can also be used as a means of inserting additional classificatory data (such as geographic information needed to produce fine area statistics) directly into the economic census data files.

31. A further feature of the Australian integrated system is the use of the Integrated Register to facilitate the design, selection and operation of sample surveys compatible with the integrated economic censuses. By re-assembling data onto an enterprise basis, the Integrated Register enables sample surveys to be conducted utilising (say) the enterprise unit, even though the benchmark data from the censuses may relate to establishments.

32. The ability to form non-standard units such as the Enterprise/State unit adopted in the employer

surveys, and to record details of activities other than the predominant activity of units further extends the potential of the Integrated Register. In particular, these features have facilitated the process of rationalisation of collection specific register development and maintenance, and have provided a cost effective means of producing activity data with an industry dimension (e.g. total road freight activity by industry undertaking that activity).

33. There are a small number of economic collections, however, which continue to draw their populations from sources other than the Integrated Register (e.g. collections in the foreign investment and private finance fields). While these collections are based on the common conceptual framework for all economic collections, for practical reasons each maintains a separate units register. As these registers are periodically reconciled with the Integrated Register, an integrated operational framework is established. Although such integration is achieved by means of a different physical implementation to that described in the preceding paragraph, it is nevertheless appropriate to regard statistics produced from these collections as 'integrated'. To ensure that the separate registers remain cost effective solutions in each case, they are kept under periodic review.

#### Uses in Establishing Data Links for Individual Units

34. The use of the Integrated Register as the basic framework for a variety of economic censuses and surveys has allowed the establishment of links between different sets of statistical data at the individual unit level, thus increasing the usefulness of the data collected. In the near future it will include selection histories for individual units, thereby further assisting in the monitoring and control of the reporting burden on businesses.

35. Use of the Integrated Register has substantially improved the industry classification of employment data from the population census. Prior to 1971, the basis of classifying individuals to industries in the population census had been to ask each individual to describe the industry of the individual's place of work. Allocating an industry code on this basis was unsatisfactory because of the difficulty of explaining the meaning of industry in population census instructions and the common tendency amongst respondents to confuse industry with occupation. As a result, population census statistics of the distribution of the labour force amongst industries had not been fully comparable with industry data derived from other sources such as economic censuses.

36. The system now used in the population census concentrates on obtaining an accurate statement from the individual of that person's employer's name and address of place of work. This is then matched, where possible, with an index of businesses and their locations produced from the Integrated Register. This index shows the industry code of each establishment, and it is the matched establishment code that is allocated to the individual's census record. This ensures that all persons working at a particular establishment carry the same industry code in population census data as the establishment itself carries in economic census data, greatly facilitating reconciliation and co-ordination of

uses of data from the two sources. A similar system operates for population surveys. Of course in both the population census and surveys, the effectiveness of these procedures is only limited by the quality of information supplied by the respondent (particularly in the census) and the coverage, reliability and currency of information about establishments on the Integrated Register.

37. This system is also applied to other characteristics. For example, the index referred to above includes a zone code, which is inserted on the population census record as a destination zone relating to place of work (or place of instruction in the case of students). This information, together with similar area codes allocated to individuals' places of living, enables production of census tabulations linking origin and destination zones. These tables show work/study travel patterns and are used in planning transport services and infrastructure.

#### Uses to Support Statistical Co-ordination

38. From time to time, the ABS has agreed to mail out material on behalf of other organisations. In all such cases, strict conditions as to purpose, resource availability and confidentiality have had to be met. More recently, Clause 6 of the Ministerial Determination forming Statutory Rules 1983, No. 19 gives the Australian Statistician discretionary powers to release lists of businesses or organisations to certain government departments or authorities for specified non-regulatory purposes.

39. The main purpose of the release of lists provision and the mail out service is to achieve greater overall co-ordination of government statistical activities; in particular:

- i Use of ABS registers, and especially the Integrated Register, lowers the aggregate cost of statistical information to Government by avoiding duplication of effort in compiling and maintaining registers of businesses.
- ii Compatibility of statistics collected by ABS and other government agencies is improved by providing a single source of statistical units with their assigned classifications relating to industry, type of legal entity and size.
- iii Provision of a more co-ordinated statistical service may also contribute to an overall reduction in respondent burden.

#### Other Uses of the Integrated Register

40. There are many other ways in which the Integrated Register is and will be used in the future; for example:

- i The register is used to provide lists or counts of units with specified characteristics or combinations of characteristics. These are useful in many special investigations such as feasibility studies of possible new statistical surveys and in monitoring coverage in relation to existing continuing surveys.
- ii The register is used as a source of periodic analyses of the structure of the business

population (within the limits of the coverage, reliability and currency of data recorded in the register) by producing tabulations cross-classifying units on the basis of characteristics (e.g. industry, size, area, etc.) of the units recorded.

- iii The register can also be used to identify the nature and extent of structural change taking place in the economy by identifying changes over time in the industry, size or location of individual units.

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## AUSTRALIAN BUREAU OF STATISTICS

### STANDARDS FOR STATISTICAL UNITS IN AUSTRALIAN INTEGRATED ECONOMIC STATISTICS (SSU)

#### (ABS CATALOGUE NO. 1231.0)

This new 142 page publication, to be issued shortly, is an essential reference for a detailed understanding of the standards for defining the transactor-type statistical units which are used in integrated economic statistics.

The statistical units which are the subject of this document are the business, government and institutional units of interest in what can be loosely described as 'economic' statistics, for example, statistics of production, capital formation and employment.

The statistics are described as 'integrated' since they are based on a conceptual framework which requires the rigorous application of the standards for defining statistical units, classifications and data items. This enables the valid comparison and aggregation of all the statistics which are collected and compiled according to those standards.

The SSU not only describes the fundamental conceptual framework but also the general principles for defining statistical units in a system of integrated economic statistics, the application of these principles in interpreting and applying the broad concepts in Australia, and the resulting detailed statistical units definitions and working rules.

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